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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
12/302,177	09/02/2009	Robert Harold Bateman	M-473-02	4879

43840 7590 12/01/2016  
Waters Technologies Corporation  
Legal/IP Department  
34 MAPLE STREET  
MILFORD, MA 01757

EXAMINER
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PURINTON, BROOKE J

ART UNIT	PAPER NUMBER
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2881

NOTIFICATION DATE	DELIVERY MODE
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12/01/2016

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UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE PATENT TRIAL AND APPEAL BOARD

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*Ex parte* ROBERT HAROLD BATEMAN,  
JEFFERY MARK BROWN, MARTIN GREEN,  
JASON LEE WILDGOOSE, ANTHONY JAMES GILBERT,  
and STEVEN DEREK PRINGLE

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Appeal 2015-005936  
Application 12/302,177  
Technology Center 2800

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Before MICHAEL P. COLAIANNI, MONTÉ T. SQUIRE, and  
DEBRA L. DENNETT, *Administrative Patent Judges*.

DENNETT, *Administrative Patent Judge*.

DECISION ON APPEAL<sup>1</sup>

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<sup>1</sup> In our Opinion below, we refer to the Final Action mailed May 16, 2014 (“Final Act.”), the Appeal Brief filed November 13, 2014 (“App. Br.”), the Examiner’s Answer mailed March 25, 2015 (“Ans.”), and the Reply Brief filed May 21, 2015 (“Reply Br.”).

STATEMENT OF THE CASE

Appellants<sup>2</sup> appeal under 35 U.S.C. § 134 from a rejection of claims 1, 16, 23, 25, 28, 32-34, 59, 80, 83, 88, and 97–104. We have jurisdiction under 35 U.S.C. § 6(b).

We REVERSE.

The claims are directed to methods and apparatuses for mass spectrometry comprising conversion of ion arrival times or ion intensities into multiple intensities or arrival times. Claim 1, reproduced below with the limitation in dispute highlighted, is illustrative of the claimed subject matter:

1. A method of mass spectrometry comprising:  
signal;

digitising a first signal output from an ion detector to  
produce a first digitised signal;

determining or obtaining a second differential or a  
second difference of said first digitised signal;

determining the arrival time  $T_0$  of one or more first ions  
from said second differential or second difference of said first  
digitised signal;

determining the intensity  $S_0$  of said one or more first  
ions;

***converting the determined arrival time  $T_0$  of said one or more first ions into a first arrival time  $T_n$  and a second arrival time  $T_{n+1}$  and converting the determined intensity  $S_0$  of said one or more first ions into a first intensity or area  $S_n$  and a second intensity or area  $S_{n+1}$ ; and***

storing said first arrival time  $T_n$  and said second arrival  
time  $T_{n+1}$  and said first intensity or area  $S_n$  and said second

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<sup>2</sup> Appellants identify the real party in interest as Micromass UK Limited. App. Br. 4.

intensity or area  $S_{n+1}$  in two substantially neighbouring or adjacent pre-determined time bins or memory locations.

App. Br. 33 (Claims App'x, emphasis added).

## REFERENCES

The prior art relied upon by the Examiner in rejecting the claims on appeal is:

Tomlinson	US 5,121,443	June 9, 1992
Rather	US 2003/0218129 A1	Nov. 27, 2003
Nenonen et al. ("Nenonen")	US 2005/0058343 A1	Mar. 17, 2005
He et al. ("He")	US 2005/0143982 A1	June 30, 2005

## REJECTIONS

The claims stand rejected under 35 U.S.C. § 103(a) as follows: claims 1, 16, 23, 25, 28, 32-34, 59, 80, 83, 88, 97, 98, and 103–104 over Rather further in view of Tomlinson and He, and claims 99–102 over Rather further in view of He. Final Act. 7, 18.

## OPINION

The Examiner relies on Rather to teach most of the limitations of the claims, on Tomlinson to teach extracting second derivatives from data (a limitation present in all of the pending claims except 99–102), and on He to teach “converting the determined arrival time  $T_0$  of said one or more first ions into a first arrival time  $T_n$  and a second arrival time  $T_{n+1}$  and converting the determined intensity  $S_0$  of said one or more first ions into a first intensity

or area  $S_n$  and a second intensity or area  $S_{n+1}$ .” Final Act. 7–8. The limitation that the Examiner says is taught by He is present in all of the pending claims.<sup>3</sup> App. Br. 33–38 (Claims App’x).

Appellants contend that the Examiner fails to make a prima facie case of obviousness because there is no apparent reason for one of ordinary skill in the art to combine known elements in the fashion claimed. *Id.* at 10 (citing *KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 418 (2007)).

Appellants contend that neither Rather nor He teach binning methods that meet the limitations of the claims. *Id.* at 13–14. Rather is said to disclose a conventional binning arrangement in which the time of flight and intensity of the signal are calculated for ion peaks in a mass spectrometer. *Id.* at 13. According to Appellants, in Rather, the ion’s actual arrival time is lost, due to the conventional binning. *Id.*

Appellants argue that He only deals with one-dimensional data (as opposed to both time and intensity, used in the invention). *Id.* at 14. Moreover, Appellants contend that He describes a re-binning process in which histogram bins are distributed into a desired number of complementary cumulative distribution function curve (CCDF) bins. *Id.* Appellants urge that there is no reason for one of ordinary skill in the art at the time of the invention to create a CCDF curve, as disclosed in He, in connection with mass spectrometry, as discussed in Rather. *Id.* In addition, according to Appellants, if one were to re-bin the histogram generated in

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<sup>3</sup> Claim 97, 98, 101, and 102 require “converting the determined arrival time  $T_0$  or mass or mass to charge ratio  $M_0$ ,” rather than only  $T_0$ , but the Examiner’s arguments are identical for these claims which, therefore, are not addressed separately.

Rather, the original time data would have already been lost and unrecoverable. *Id.*

The Examiner contends that modification could be made of “the apparatus of Rather and Tomlinson’s histogram ‘when the histogram bin does not align with a single CCDF bin’ (He, [30]) or when the event being detected does not align with a single histogram bin that it is desired to split it into, and storing the new values in adjacent time bins or memory locations.” Final Act. 8. According to the Examiner, one of ordinary skill in the art at the time of the invention would have made the modification to allow a better and more proportional distribution of ion intensity between ion arrival time bins and a more precise peak layout on a mass spectrum because of the improved binning division.

We agree with Appellants that the Examiner has not provided an apparent reason to combine He’s techniques with Rather’s method and apparatus. The Examiner provides no citation to the record in support of the proposed combination, and has failed to identify a reason that would have prompted a person of ordinary skill in the relevant field to combine the elements in the way the claimed new invention does. *See, e.g., KSR*, 550 U.S. at 418; *In re Kahn*, 441 F.3d 977, 988 (Fed. Cir. 2006) (“[R]ejections on obviousness grounds cannot be sustained by mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness.”); *In re Rouffet*, 149 F.3d 1350, 1358 (Fed. Cir. 1998) (“hindsight” is inferred when the specific understanding or principal within the knowledge of one of ordinary skill in the art leading to the modification of the prior art in order to arrive at appellant’s claimed invention has not been explained).

Because all other claims on appeal recite the same disputed limitation, our decision on claim 1 controls the outcome for all claims.

We reverse the Examiner's prior art rejection under 35 U.S.C. § 103(a) for the reasons presents by Appellants and given above.

#### DECISION

For the above reasons, the Examiner's prior art rejection of claims 1, 16, 23, 25, 28, 32-34, 59, 80, 83, 88, and 97–104 is reversed.

REVERSED